THE INSTITUTE OF PHYSICS

47, BELGRAVE SQUARE, LONDON, S.W.1

BULLETIN

No. 4 *Information in this circular is not intended for general publication: your copy should not therefore be passed to a library.* APRIL 1950

DIARY OF INSTITUTE MEETINGS

Members may bring guests to any of the meetings listed below unless otherwise indicated.

April 13th, 14th (X-ray Analysis Group). At the Royal Institution, Albemarle Street, London, W.1. **"The Production and Application of High Intensity X-ray Beams." Conference.**

April 14th (Manchester and District Branch). 7.0 p.m. at Huddersfield Technical College.
Dr. J. S. Anderson, "Conductivity, Catalysis and Surface Reactions on Oxides." (Joint meeting with the Huddersfield section of the Royal Institution of Chemistry.)

April 21st (London and Home Counties Branch). 2.30 p.m. Afternoon visit to the Laboratories of British Scientific Instrument Research Association. Attendance by ticket only.

April 25th (Scottish Branch). 7.0 p.m. at the Natural Philosophy Department, University of Glasgow.
Prof. F. C. Williams, "Electronic Calculating Machines."

April 25th (North-Eastern Branch). 7.0 p.m. The Physics Department, King's College, Newcastle-upon-Tyne.
Dr. L. A. Sayce, "The Light Division of the National Physical Laboratory."

April 26th (Scottish Branch). 7.0 p.m. at the Natural Philosophy Department, University of Edinburgh, Drummond Street.
Prof. F. C. Williams, "Electronic Calculating Machines."

April 28th (Industrial Spectroscopy Group). 5.30 p.m. at the Institute's House, 47, Belgrave Square, London, S.W.1.
Dr. P. Coheur, "Direct Spectrochemical Analysis."

April 28th (South Wales Branch). 8.0 p.m. in the University College, Aberystwyth.
Mr. E. R. Davies, "The Photographic Plate in Nuclear Physics."

ANNUAL GENERAL MEETING

The Annual General Meeting of the Institute will take place in the Institute's House on July 20, 1950, when the Annual Report and Accounts (pp. 3–14) will be presented for adoption and the result of the ballot for the election of the Honorary Officers and other members of the Board nominated will be declared.

Formal notice of the meeting and ballot papers will be circulated in due course.

NOTICES TO MEMBERS

New Exhibits at the Science Museum

A model of the first Harwell atomic pile, the "G.L.E.E.P.," has been lent to the Science Museum by the Ministry of Supply and is now on exhibition on the second floor of the Museum.

Among neighbouring exhibits are Aston's original mass-spectrograph of 1919 and part of Cockcroft and Walton's original apparatus with which artificial disintegration by purely electrical means was first achieved in 1932.

In a recently re-opened gallery on the top floor of the Museum are structure models and exhibits showing the development of electron physics. The Electrical Instruments and Acoustics Collections are also on view in this gallery.

Benevolent Fund

From time to time members inquire about the possibility of signing 7-year covenants for donations to the Benevolent Fund in order that the Fund may benefit by the income tax recovered. The difficulty hitherto has been that the time and effort required to recover the tax on the average donation has been too much to justify the small amount involved. The Fund Committee has, however, carefully re-examined this question and has decided that it would be justifiable to accept such covenants when the net annual donation paid by the member is not less than one guinea. Members who wish to support the Fund in this way are invited to apply to the Secretary for the appropriate form.

Design of Laboratories

In 1947 the London and Home Counties Branch of the Institute held a symposium on "The Design of Physics Laboratories" (*J. Sci. Instrum. and Phys. in Ind.*, p. 157, May 1948), at the conclusion of which a Resolution was passed inviting the Board to follow up the subject and to issue a Report. It was agreed that in view of the problems common to most laboratories, other institutions might be invited to participate, perhaps

through the Royal Institute of British Architects. That Institute accepted the suggestion and convened a meeting of representatives of professional institutions and other bodies of which Dr. S. Whitehead was elected Chairman. The Committee submitted a memorandum to the Lord President of the Council drawing attention to the need for an investigation into the design of scientific laboratories. The proposals made in the memorandum have been considered by the Government Departments concerned, who have expressed appreciation of the interest which the Royal Institute of British Architects and other professional organizations have taken in the matter.

Particular reference was made in the memorandum to the needs of educational buildings. It is, therefore, of interest to state that a small group has been set up in the Architects' Branch at the Ministry of Education among whose duties are: (*a*) to investigate educational requirements, particularly in the light of any new developments in teaching technique, and to recommend how these requirements can best be met in terms of architecture; (*b*) to study the latest scientific information in the light of the needs of educational requirements; and (*c*) to make the results of their studies available to Local Education Authorities and any private architect concerned.

Work has started on secondary schools and technical colleges. The investigation planned will cover the requirements of the teaching establishment as a whole, for while the Ministry recognizes the need for special study of the requirements of teaching laboratories—and this will form a definite part of the programme—it is felt that such a study should not be made in isolation from those of the requirements of the building as a whole. Another reason for adopting this broad approach is that other specialist accommodation at the education establishments concerned is just as much in need of investigation as the laboratories.

The more general issue of laboratory design raised in the memorandum has also been considered.

It has been felt that the most practical approach would be by the appointment of an architect with a small staff to make a special study of the subject, which has many ramifications, by direct contact with all possible sources with a view to the issue of a series of Technical Notes. The Ministry of Works propose to keep in mind the possibility of making arrangements accordingly, though it will be realized that present economic circumstances may militate against such an extension of these activities, which is closely related to the Ministry's work, in connexion with the Professional Institutions, on Codes of Practice for buildings.

Change of Branch and Group Officers

London and Home Counties Branch. Dr. A. J. Maddock has succeeded Dr. H. Lowery as Chairman of the Branch and Dr. W. F. Berg has been elected Vice-Chairman. Dr. H. L. Penman continues as Honorary Secretary.

International Congress of Radiology

As was reported in the February issue of the Bulletin, the sixth International Congress of Radiology will be held in London from July 23 to 29, 1950. Membership of the Congress will be limited to those who are members of a National Radiological body or are sponsored by such a body; the Council of the British Institute of Radiology has kindly offered to sponsor any member of the Institute who wishes to attend. Members who wish to take advantage of this offer should write to the Secretary of The Institute of Physics.

NEWS OF MEMBERS

Honorary Fellow

Sir Edward Appleton has been awarded the Sir Devaprasad Sarvadhikary Gold Medal for the year 1949 by the University of Calcutta.

Fellows

Professor E. N. Da C. Andrade has been elected Correspondent for the Section of General Physics of the Paris Academy of Sciences. The title of Emeritus Professor of Physics in the University of London has also been conferred upon him.

Professor L. F. Bates has been elected a Fellow of the Royal Society.

G. W. Warren was awarded the M.B.E. in the New Year Honours List.

D. F. Martyn has been elected a Fellow of the Royal Society.

The following professional appointment has been notified:

F. Gutmann—Director of Dielectric Research in the New South Wales University of Technology, Sydney, Australia.

Associates

The following professional appointments have been notified:

M. Davis—Staff of the Department of Metallurgical Engineering, University of Toronto, Canada.

J. Goodier—Head of the Physics Department, Lancing College, Shoreham-by-Sea, Sussex.

E. A. G. Knowles—Lecturer in Industrial Statistics, University of Birmingham.

"The Principle of the Dangerous Precedent. . . . Every public action which is not customary either is wrong, or, if it is right, is a dangerous precedent. It follows that nothing should ever be done for the first time."

F. M. CORNFORD.

REPORT OF THE BOARD OF THE INSTITUTE OF PHYSICS FOR THE YEAR 1949

The Board and its Committees

The present Board took office on October 1, 1949; its Members are:

President: Dr. F. C. Toy.

Past Presidents: Prof. A. M. Tyndall, Sir Frank Smith.

Vice-Presidents: Prof. J. A. Crowther, Dr. S. Whitehead, Mr. D. A. Oliver, and Dr. T. E. Allibone.

Hon. Treasurer: Mr. E. R. Davies.

Hon. Secretary: Dr. B. P. Dudding.

Ordinary Members: Mr. J. H. Awbery, Mr. N. L. Harris, Dr. T. L. Ibbs, Mr. T. C. Keeley, Dr. J. H. Nelson, Dr. H. L. Penman, Mr. E. W. H. Selwyn, and Dr. J. Topping.

Chairman of Branches in Great Britain: Dr. H. Lowery (London and Home Counties), Dr. F. A. Vick (Manchester and District), Dr. D. Parkinson (Midland), Prof. G. W. Todd* (North Eastern), Prof. P. I. Dee (Scottish), Prof. F. Llewellyn Jones (South Wales).

Appointed by Participating Societies: Mr. W. A. Langmead (British Institute of Radiology), Dr. H. H. Hopkins and Dr. A. C. Menzies (Physical Society), Dr. G. D. Robinson (Royal Meteorological Society), (The Faraday Society's representative to be appointed).

* Died February 24, 1950.

The Board and Committees

During the year the Board met six times and appointed the undermentioned Standing Committees which held twenty-five meetings.

	Chairmen
Finance and General Purposes Committee	The Honorary Treasurer
Membership Committee	Dr. J. Topping
Education Committee	Prof. F. Llewellyn Jones
Laboratory Arts Committee	Prof. J. A. Crowther
Benevolent Fund Committee	The Honorary Treasurer
Advisory Committee of the Journal of Scientific Instruments	Dr. R. S. Clay.
Advisory Committee of the British Journal of Applied Physics	The President
Publications Policy Committee	The President
House Committee	The Honorary Treasurer

Representatives on Joint Committees and other Bodies

The Institute has been represented as follows:*

On the Royal Society's National Committee for Physics: Mr. J. H. Awbery.

On the Royal Society's National Committee for Crystallography: Prof. E. G. Cox.

On the Royal Society's Paul Instrument Fund Committee: Sir Frank Smith.

On the Joint Council of Professional Scientists: The President, The Honorary Secretary, The Honorary Treasurer, Dr. T. E. Allibone, Mr. A. J. Philpot, Dr. H. R. Lang.

On the Parliamentary and Scientific Committee: Dr. B. P. Dudding and Dr. H. R. Lang on the General Committee, together with Dr. H. Lowery and Professor L. F. Bates at the Annual Meeting.

On the Parliamentary and Scientific Committee's Subcommittee on the Education of Technicians: Dr. J. Topping, Mr. N. Clarke.

On the Joint National Certificates Committee (with the Ministry of Education): Mr. D. A. Oliver, Mr. E. W. H. Selwyn, Dr. J. Topping, Mr. W. S. Vernon.

On the Joint National Certificates Committee (with the Scottish Education Department): Prof. P. I. Dee, Dr. R. S. Silver and Dr. A. G. White.

On the Science Advisory Committee of the Municipal Technical College, Blackburn: Dr. F. A. Vick.

On the Advisory Committee of the Ipswich School of Technology: Mr. H. A. Nancarrow.

On the Committee of the Council of Industrial Design for the Selection of Scientific Instruments for Display at the 1951 Festival of Britain: Mr. A. G. Peacock.

On the Joint Library Committee (with the Physical Society): Dr. J. S. Forrest, Mr. N. L. Harris, Dr. J. H. Nelson, Mr. F. I. G. Rawlins.

On the City and Guilds of London Institute's Committee on Education and Training of Laboratory Technicians: Dr. R. S. Clay, Mr. L. Walden, and Mr. N. Clarke.

British Standards Institution: The Institute has been represented on a number of technical committees and sub-committees of the B.S.I.

* Summaries of the work of these Committees, supplied by the representatives on them, when not referred to in the Report, will be found in the Appendix.

The Register

TABLE I—THE ROLL OF THE INSTITUTE

	Total on Dec. 31 1948	CHANGES DURING 1949							Total on Dec. 31 1949
		New	*Transfers to*	*Resigned*	*Deceased*	*Removed*	*Transfers from*	*Net inc. or decrease*	
Honorary Fellows	3	1	—	—	—	—	—	+ 1	4
Fellows	862	12	14	5	11	—	—	+ 10	872
Associates	1 248	80	79	13	3	1	14	+ 128	1 376
Graduates	—	13	41	—	—	—	—	+ 54	54
Companions	—	—	—	—	—	—	—	—	—
Subscribers	524	71	3	38	1	9	3	+ 23	547
Students	818	193	—	45	1	41	120	— 14	804
Total	3 455	370	137	101	16	51	137	202	3 657

Deaths.—The Board records with regret the deaths in 1949 of:

Founder Fellows: J. E. Barnard, N. R. Campbell, J. H. Coste, C. L. Fortescue, W. B. Morton, D. E. Thomas. *Fellows:* W. Bowen, C. H. Lander, R. Samuel, G. Shearer, J. H. Reynolds. *Associates:* F. G. W. Brown, E. S. H. Gibson, F. A. Howe. *Subscriber:* D. J. Scourfield. *Student:* R. A. B. Mochrie.

Membership Committee

The applications received during the year are shown in the Table 2, with the previous year's figures in brackets.

TABLE 2—ANALYSIS OF MEMBERSHIP COMMITTEE'S DECISIONS

	Applications received	*Recommended for election or transfer*	*Recommended for rejection*	*Awaiting consideration or deferred for interview or information*
Fellows	37 (55)	22 (19)	6 (27)	9 (9)
Associates	200 (168)	132 (135)	12 (20)	53 (13)
Graduates	126 —	52 —	3 —	71 —
Students	207 (184)	165 (181)	3 (3)	39 —
Subscribers	82 (70)	57 (70)	— —	25 —
Total	652 (477)	428 (405)	24 (50)	197 (22)

The Examining Panel met five times during the year and interviewed 32 candidates, upon whose applications the Membership Committee was unable to reach a decision on the basis of written evidence only. One meeting was held in Glasgow, the remainder at the Institute's House in London.

The Committee has continued to investigate applications from Technical Colleges for official recognition by the Institute as institutions suitable for the training of physicists. Colleges applying have been inspected, in each case by two Fellows and the Deputy Secretary of the Institute accompanied by one of His Majesty's Inspectors (Ministry of Education). To date 28 colleges have been granted official recognition.

General Meetings

The 29th Ordinary Meeting of the Institute was held on May 20, 1949, at the Playhouse, Buxton, during the Institute's Convention.

An Extraordinary General Meeting was held in London on September 15th, when Articles 2, 4, 8, 9, 10, 23, 25, 68, 93 and By-Laws 4, 15, 21, 32, 33, 35, 41, 44 were amended.

Education

National Certificates in Applied Physics.—There are now nine colleges in England and Wales whose schemes for the courses for the Ordinary National Certificate in Applied Physics have been approved by the Joint Committee of the Institute and the Ministry of Education. Other colleges whose courses are in the first two years only will be applying for recognition on starting the third year of the course. Forty-two candidates entered for the examination for the Ordinary Certificate and thirty-four were successful and have been awarded certificates.

A joint Committee with the Scottish Education Department was established at its request. Rules have been agreed under which Technical Colleges in Scotland may establish courses for the Ordinary and Higher National Certificates in Applied Physics and although these are generally similar to the rules applying in England and Wales some changes have been made particularly concerning the holding of practical examinations. The first candidates will be presented in Scotland in 1950.

Education and Training of Laboratory Technicians.—An invitation from the City and Guilds of London Institute to appoint three representatives to an Exploratory Committee on the Education and Training of Laboratory Technicians, was accepted. It arose from the final report of the Joint Committee on the Education and Training of Laboratory Technicians, on which the Institute was represented, which was set up following a conference on the subject convened in 1946. That Committee considered that the best way to put these

recommendations into practical effect would be by inviting the City and Guilds of London Institute to act in consultation with appropriate bodies such as were represented on the Committee, as the examining body for nationally recognised Certificates in laboratory arts and techniques. That Committee also considered this to be the best way in which to co-ordinate and extend the existing schemes of training and education and subject to certain safeguards, the Laboratory Arts Committee advised the Board to accept this view. The City and Guilds Committee made considerable progress during the year and it is hoped to establish courses for the new certificate in a year or two.

Summer Schools.—The Institute collaborated with the H. H. Wills Physical Laboratory of the University of Bristol in a Summer School in September on Theoretical Physics, with particular application to crystal growth and related problems.

The Stress Analysis Group also arranged two Summer Schools as reported below.

Publications

At the beginning of the year on the recommendation of its Publications Policy Committee the Board decided that there should be a considerable increase in the amount of the Institute's publications and in this connexion it received detailed reports from its sub-committees and reached the decisions referred to below.

The British Journal of Applied Physics.—Arrangements were completed for the *British Journal of Applied Physics* to commence publication as a monthly periodical in January, 1950. This Journal has as its basis the "Physics in Industry" section of the Institute's existing Journal which is again to be devoted solely to scientific instruments and apparatus.

Journal of Scientific Instruments and of Physics in Industry.—The 1949 volume consisted of the usual 12 monthly parts and comprised 416 pages of text compared with the previous year's 448 pages. 151 papers and 51 laboratory and workshop notes were submitted during the year (compared with 138 papers and 48 notes in 1948); of these 103 papers were accepted, 42 of them after modification to meet referees' requirements; 36 notes were accepted, 10 of them after modification; 15 specially invited articles were included in the volume, and descriptions of 39 new instruments and tools; notices of 119 new books and pamphlets and 80 manufacturers' publications were also included.

Physics in Industry Monograph Series.—Further volumes in the "Physics in Industry" series were commissioned and the printing of one on *The Acceleration of Particles to High Energies*, based on a session arranged by the Electronics Group at the Buxton Convention was put in hand.

Bulletin.—A monthly *Bulletin* to replace *Notes and Notices* was decided upon and arrangements were made for it to commence in January, 1950.

Books.—During the year, the 2nd Edition of the *Handbook of Industrial Radiology* prepared by Members of the Industrial Radiology Group and edited by Prof. J. A. Crowther (Vice President) was published by Messrs. Edward Arnold and Co. for the Institute. A selection from the "Laboratory and Workshop Notes" published in the *Journal of Scientific Instruments* and compiled and edited by Dr. Ruth Lang (Associate) was also published by this firm for the Institute. The royalties from both of these books are credited to the Institute's Benevolent Fund. A bibliography of papers on Electron Microscopy prepared under the auspices of the Electron Microscopy Group and edited by Dr. V. E. Cosslett was sent to Press towards the end of the year and is also being published for the Institute by Messrs. Arnold and Co.

Copying from the Institute's Publications.—The Board accepted an invitation from the Royal Society (following the Scientific Information Conference) to subscribe to a declaration regarding copying from the Institute's publications for bona fide scientific work. Difficulties might otherwise arise under Copyright when libraries supplied photo-copies.

Professional Matters

The executive officers have, as usual, dealt with many individual inquiries about salaries, conditions of service, consulting fees, professional training and similar matters, received from members, employers and prospective students. In this connexion, the Board acknowledges the help and advice the officers have received from Members with specialist knowledge.

The Institute, Parliament and the Ministries

Wireless Telegraphy Bill.—Further communications from the G.P.O. and the Institution of Electrical Engineers were before the Board during the year, together with reports from two members of the Board specially interested in the Bill. It was agreed that no further action was called for at present and the two members were asked to continue to keep the Board informed of developments.

Radio-active Substances Bill.—The Board followed the passage of this Bill through Parliament and was glad to learn that four of its Fellows had been appointed to serve on the Statutory Advisory Committee set up under the Bill. They have been asked to bear in mind the interests of experimental physicists.

Training of Radiographers.—An invitation from the Ministry of Health to submit evidence and comments on the training in physics available to radiography students and information concerning the training and employment of radiographers was accepted. A report prepared by the Industrial Radiology Group was approved by the Board and passed to the Ministry with an offer to support it by oral evidence.

Income Tax on Annual Subscriptions.—The Institute subscribed to the Memorandum submitted to the Chancellor of the Exchequer representing that subscriptions to scientific and professional bodies should be allowed as a charge against income of persons assessed for Income Tax under Schedule E, whether or not Membership is a continuing obligation for employment.

Buxton Convention

The first Convention of its kind to be organized by the Institute took place in Buxton, Derbyshire, during May 19th, 20th and 21st and was in the nature of an experiment, which proved successful and achieved its main object, to bring together members of all grades of the Institute so that they might "learn something of each other's particular field of work and, perhaps even more important, come to know each other better as members of a corporate body." It was thus intended primarily as a domestic affair, and unlike previous Institute Conferences, visitors, other than members' ladies, were not encouraged. The analysis of those attending was as follows: Members 305, Members' ladies 70 and other guests 45—a total of 420.

The Conference and Exhibition arranged by the Groups were opened on the Thursday morning by the President. The first Conference session was a symposium on "Physical Analysis and Testing," to which each of the six Groups of the Institute made a contribution. In the afternoon the Groups had their own programmes of visits, lectures and discussions. The evening was devoted to a discussion, opened by the President, on "The Institute, Past, Present and Future"; the report of this discussion was printed in *Notes and Notices* for July.

Friday morning opened with the Institute's Statutory Annual General Meeting, and was followed by a symposium on "The Development and Application of X-ray Analysis," which had been specially arranged for non-specialists by the X-ray Analysis Group. The afternoon was again given over to Group meetings. The evening commenced with a brilliant discourse by Prof. A. M. Tyndall (Past President) on "Atomic Particles—a Survey of Recent Discoveries," which was followed by the Convention dinner and dance. The Saturday morning session was arranged by the Electronics Group and was a symposium on "Means of Accelerating Particles to High Energies," the discussion on the papers being held in the afternoon. The Stress Analysis Group held a parallel session in the morning, when a number of specialist papers were read.

One of the features of the Convention was the Exhibition, to which each of the Groups contributed items demonstrating the applications of their particular subjects. The Exhibition, consisting of photographs, models and instruments, was not open to the public, but on Friday afternoon conducted tours were arranged for parties of senior school boys and girls.

Some special excursions to local beauty spots and places of interest were arranged for the ladies.

The Board desires to record here its thanks to Mrs. Toy, Mrs. Vick and Mrs. Penman who arranged the entertainments for the ladies; to the Group Officers and Dr. Follett for their help; to the Council and Officers of the Borough of Buxton for the loan of the Pavilion and the Playhouse for meetings and for the exhibition, and to the following for allowing parties to visit their laboratories and works: Imperial Chemical Industries Ltd.; The Safety in Mines Research Board; and The Admiralty's Bragg Laboratories, Sheffield.

The Institute's House

The main part of the programme for the adaptation and renovation of the Institute's House was completed during the year.

The meeting and committee rooms have been in regular use during the year as shown by the following figures:—

Institute Meetings

Board and Committee meetings including Branch and Group Committees	46
Lecture meetings and conferences	18

Other Meetings

The rooms have also been used by sister institutions as follows:

Committee meetings	21
Lecture meetings	3

The canteen has continued to provide teas and other light meals on meeting days and at the Conferences held in the House, in addition to those provided daily for the staff.

Library Facilities

Members and Students continue to make good use of the facilities offered through the Institute by the Science Museum Library for the loan of books and periodicals, and occasional use is also made of the Joint Library maintained with the Physical Society in its rooms.

The Members' room at the Institute's House contains a small selection of current periodicals which has proved useful to Members visiting the House.

Relations with the American Institute of Physics

Information has again been exchanged during the year with the American Institute of Physics and the Board records its thanks to the Director, Dr. H. Barton for his help and advice on a number of matters and particularly in assisting Members who have visited America during the year.

Deputy Secretary

Owing to the continued growth of the work at the Headquarters of the Institute the Board created the post of Deputy Secretary, and appointed Mr. N. Clarke to it. Mr. Clarke had been the Assistant Secretary since 1945 and took up this new post on January 1, 1950.

Annual Conference of Branch and Group Officers

The sixth annual Conference of Branch and Group Officers was held on the 18th May (the eve of the Convention in Buxton). The President was in the Chair. A senior Fellow from Australia and one from India, who were visiting England, were present by invitation. Among items discussed were the proposed changes in the Membership Regulations, the expansion of the Institute's publications, the formation of new Groups, changes in the boundaries of Branches and proposals to hold regular Institute social functions. A number of proposals arising from these discussions were submitted to the Board.

Activities of the Branches and Groups

Australian Branch.—President: Dr. C. E. Eddy. *Honorary Secretary-Treasurer:* Dr. G. H. Briggs (348 members).

The five Divisions in the different parts of the Commonwealth held thirty-nine meetings for lectures and discussions, including addresses by distinguished visitors. The Branch held a three-day conference on "X-rays in Industry" in Melbourne in November. Its scope included modern X-ray equipment and techniques, industrial radiography and special research applications, and visits were paid to Government laboratories.

The Branch was represented on the Australian National Committee on Illumination by Dr. G. H. Briggs, and on the National Co-operating Body for National Sciences for U.N.E.S.C.O. by Dr. C. E. Eddy.

Indian Branch.—President: Sir C. V. Raman; *Honorary Secretary:* Dr. H. P. Waran (60 members).

The Committee of the Branch has continued to assist the Membership Committee by advising upon applications received from India.

London and Home Counties Branch.—Chairman: Dr. S. Whitehead succeeded by Dr. H. Lowery; *Honorary Secretary:* Dr. H. L. Penman (1540 members).

The Branch held five lecture meetings, one jointly with the Royal Meteorological Society and visited the Biophysics Research Unit at University College, London. The summer visit was to the Clarendon Laboratory, Oxford.

Manchester and District Branch.—Chairman: Prof. E. G. Cox succeeded by Dr. F. A. Vick; *Honorary Secretary:* Dr. F. A. Vick succeeded by Dr. A. Hargreaves (564 members).

The Branch held six meetings in Manchester, one jointly with the Low Temperature Group of the Physical Society and one jointly with the Illuminating Engineering Society. Visits were paid to the B.S.A. Group Research Centre, Sheffield and to the Physics Department of the University of Manchester.

Midland Branch.—Chairman: Prof. L. F. Bates succeeded by Dr. D. Parkinson; *Honorary Secretary:* Dr. J. H. Nelson succeeded by Mr. W. C. Hynd (320 members).

The Branch held six lecture meetings in Birmingham, and also a joint meeting with the Institution of the Rubber Industry at which a series of short papers were read.

Scottish Branch.—Chairman: Prof. P. I. Dee; *Honorary Secretary:* Dr. J. M. A. Lenihan (185 members).

The Branch held eight lecture meetings in Glasgow, one jointly with the Institute of Engineers and Shipbuilders in Scotland, the Institute of Welding and the Industrial Radiology Group, three meetings in Edinburgh and one in Dundee.

The Branch has been responsible for a pioneer experiment in the arrangement of a course of eighteen weekly lectures on Atomic and Nuclear Physics which are taking place in the University of Glasgow. This course commenced in November and has attracted an average attendance of about 100. Further courses are already being planned for future years.

South Wales Branch.—Chairman: Prof. F. Llewellyn Jones; *Honorary Secretary:* Dr. T. V. I. Starkey (176 members).

The Branch held three lecture meetings in Cardiff, four in Swansea and one in Aberystwyth.

North East Coast Branch.—Chairman: Prof. G. W. Todd;* *Honorary Secretary:* Dr. N. Thorley (145 members).

The Inaugural Business Meeting of the Branch was held on October 24th.

Education Group.—Chairman: Mr. W. Somerville Vernon; *Honorary Secretary:* Dr. J. Topping (206 members).

The inaugural meeting of the Group took place in London on October 5th when Sir Philip Morris, Vice-Chancellor of the University of Bristol, addressed it on "A Scientific Education." The second meeting was a joint discussion with the Education Discussion Circle of the Institution of Electrical Engineers.

Electronics Group.—Chairman: Mr. H. G. Hughes; *Honorary Secretary:* Mr. G. W. Warren (298 members).

The Group held six lecture meetings in London and also met during the Buxton Convention. Visits were paid to the Services Electronics Laboratory, Baldock and the Safety in Mines Board Research Laboratory, Buxton.

Electron Microscopy Group.—Chairman: Dr. A. S. McFarlane; *Honorary Secretary:* Dr. V. E. Cosslett succeeded by Mr. F. W. Cuckow (190 members).

The Group held several meetings during the Buxton Convention and also held a symposium in London on Metallurgical Applications of the Electron Microscope in collaboration with the Institute of Metals. The Group also participated in an International Conference held in Delft, Holland.

Industrial Radiology Group.—Chairman: Mr. W. J. Wiltshire; *Joint Honorary Secretaries:* Dr. J. C. Chaston, Mr. H. S. Tasker succeeded by Mr. P. Rowbotham.

The Group held three lecture meetings in London and one in Glasgow jointly with the Scottish Branch,

* Died February 24, 1950.

the Institute of Engineers and Shipbuilders in Scotland and the Institute of Welding. In connexion with the February meeting in London an exhibition of radiographs was held in the Institute's House. The Group also met during the Institute's Buxton Convention when papers were read and discussed. The Group has advised the Board on the training of industrial radiographers and on a number of matters regarding standardization of equipment and terminology, raised by B.S.I. Committees.

Industrial Spectroscopy Group.—Chairman: Mr. D. M. Smith; *Honorary Secretary:* Mr. E. van Someren (110 members).

The Group held three lecture meetings in London, two jointly with the recently formed independent Photoelectric Spectrometry Group. The Group also met during the Buxton Convention and visited the Admiralty's Bragg Laboratories, Sheffield.

Stress Analysis Group.—Chairman: Col. H. T. Jessop; *Honorary Secretary:* Mr. E. K. Frankl (150 members).

The Group held two discussions in London and also met during the Buxton Convention. It was responsible for two summer schools, one at University College, London and the other in conjunction with the Engineering Laboratory of the University of Cambridge.

X-ray Analysis Group.—Chairman: Mr. D. A. Oliver; *Honorary Secretary:* Mr. A. E. De Barr (300 members).

The Group met during the Buxton Convention when it also paid a visit to the I.C.I. Rock Salt Mines, Winsford. Its two-day Autumn Conference was held at Ashorne Hill, Leamington Spa.

The Panels constituted by the Equipment Sub-Committee have continued work on various types of X-ray equipment and user specifications for X-ray tubes and Weissenberg goniometers have been made available. The Photometer Panel has prepared a draft user specification for a photometer for powder photographs. Arrangements have been made for the sale of stereographic nets to members and a collection of reprints of papers on X-ray crystallography has been commenced and is available at the Institute's House.

Acknowledgments

The Board records its thanks to the following bodies which have generously allowed meetings of the Institute's Branches and Groups to be held on their premises: The Royal Institution; the Universities of Birmingham, Cambridge, Edinburgh, Glasgow, Manchester, Nottingham; University College, London, and the University Colleges of Cardiff, Dundee, and Swansea; the British Institute of Radiology; the Institution of Electrical Engineers, the James Watt Memorial Institute, Birmingham; Manchester College of Technology; the British Iron and Steel Corporation, Ashorne Hill.

The Board also records its thanks to the Directors of the following for allowing visits to their laboratories: The Admiralty's Bragg Laboratories, Sheffield, Clarendon Laboratory, Oxford, the B.S.A. Group Research Centre, Sheffield, Safety in Mines Board Research Laboratory, Buxton and the Services Electronics Laboratory, Baldock.

Finance

During the year the Finance Committee anxiously watched the growing commitments of the Institute in relation to its income and diminishing capital and advised the Board that it saw no alternative to an increase in subscription rates and that it should not be further delayed. A detailed statement was circulated to Members in August with proposals for a substantial increase in the subscription rates. These were adopted by an overwhelming majority and became effective on January 1, 1950. The Board also decided to increase the price of the *Journal of Scientific Instruments* to non-members with the commencement of the new volume. As will be seen from the accompanying Balance Sheets, even with this increased income, it will be some years before the Institute's financial position is sufficiently strong to enable it to undertake further financial commitments.

The 1949 accounts are presented in the same form as in previous years with the exception of the Institute's Balance Sheet which now conforms to the style required by the new Companies Act under which the Institute is incorporated.

The Balance Sheet item "For expenses" under current liabilities includes the internal adjustment of £900 due to the Endowment Trust Fund for writing off on the House account and practically the whole of the remainder of the expenses were paid at the turn of the year; they included £2300 for printing the *Journal*, the House accounts for the last quarter of the year and a number of small items for which the bills had not been received at the close of the year.

Each of the three accounts (Institute, Publications, Trust Fund) bears its agreed share of overheads. The deficit of £1076 16s. 5d. on the Institute's account is even larger than was expected in the August circular to members; the net deficit of £1016 9s. 1d. has been carried down and should be offset by the budgeted surpluses arising from the increased subscription rates. Most of the items on the expenditure side of the Institute's accounts have increased because of continually increasing activities and rising costs, but they are balanced to some extent by the increased income from members' subscriptions. The 1948 List of Members (authorized in 1946) cost £531, but £150 was set aside towards it during the war years and only the balance had to be found in 1949. The Publications Account was fortunate to receive a subvention of £950 through the Royal Society from the Parliamentary Grant-in-Aid for Scientific publications. The balance on this account is again

transferred to the Endowment Trust Fund as a reserve against future commitments for publication.

The Endowment Trust Fund again received some welcome donations from firms and the Board wishes to record its thanks for these. The Fund has been charged with the agreed items and proportions of overhead charges as in previous years.

Conjoint Subscription Scheme.—The Participating Societies notified the Board that they no longer desired the Institute to collect subscriptions for them; the arrangements were therefore terminated at the end of the year.

Benevolent Fund

The weekly allowances made last year were continued in both cases. Fortunately, the royalties from the *Handbook of Industrial Radiology* and *Laboratory and Workshop Notes* were sufficient, together with the donations from members for the Fund just to meet the calls upon it from its income.

The Committee wishes to record its thanks to those members who have made donations during the year, and to the Editors and contributors to the books.

APPENDIX

Reports from the Institute's representatives on the work of various Committees during 1949.

National Committee for Physics.—The National Committee for Physics set up an Optical sub-committee, which has been actively concerned in preparation for the meeting of the International Optical Commission in July, 1950. The National Committee was asked to nominate a representative on the committee to be set up by the International Union of Pure and Applied Physics, to consider Physical publications. This body has worked closely with the UNESCO committee on Abstracting. The National Committee has also nominated a member to the new commission on Very Low Temperatures, which is proposing to hold a conference in 1951. The Committee has considered the list of Symbols and Abbreviations put forward by the International Union of Chemistry at its Amsterdam meeting.

British Committee for Radiological Units.—In 1948 the Committee prepared a memorandum on *The Measurement of Ionising Radiations for Medical and Biological Purposes*, which was circulated to industrial and medical radiologists throughout the world, asking for their comments on the British proposal to set up a new unit, with the symbol J, applicable to all ionizing radiations. Fundamentally, the J attempts to interpret the energy absorbed in any irradiated medium in terms of the ionization which would be produced per gramme of air enclosed in an infinitesimally small cavity in the medium. The alternative method of specifying the absorbed energy in ergs per gramme of the exposed medium was dismissed because of the difficulty of making calorimetric measurements compared with ionization measurements. The general nature of the comments received is to the effect that it is preferable to express all radiation dosage in terms of ergs/gramme absorbed by the medium, even though this is reached by measuring the ionization and by translating this to ergs/gramme from a knowledge of such parameters as the energy required to produce a pair of ions and the relative stopping powers of different types of corpuscular radiations in different media.

Mr. W. Binks, the Institute's representative on the British Committee has kept in close touch with the Industrial Radiology Group and transmitted its views to the Committee.

Joint Council of Professional Scientists.—At the request of the Board, the Joint Council considered sending a note to the Colonial Office suggesting a professional code for scientists in the Colonial services and the more uniform interpretation of Government regulations restricting the scientific activities of scientists employed full-time by Colonial Governments.

The Joint Council, having received reports on the exploratory conversations concerning the extension of its work on a broader front, made proposals to the professional bodies associated with it for a more formal constitution which would enable it to continue to serve as a joint consultative body on matters of common interest to them.

Ministry of Labour and National Service, Appointments Department, Technical and Scientific Register, Physics and Mathematics Advisory Committee.—The Committee held one meeting during the year when a progress report of the physics and mathematics section of the Technical and Scientific Register was presented. The work of this section of the Register includes the placing of graduates in physics and mathematics and the collection of data and statistics on which policy discussions could be based. The average monthly figure for the number of vacancies during the year was 334 and the average number of persons placed in appointments was 22 per month. About half the new graduates in these subjects were liable for military service and these passed through this section. The Committee could not find evidence to challenge the number of D.S.I.R. awards fixed for further study and training in mathematics and physics. The Committee's discussions have also touched on the shortage of teachers, the employment of mathematicians and the Hankey Report on physicists.

Parliamentary and Scientific Committee.—The General Committee met regularly during the Parliamentary sessions and heard a further series of addresses by leading scientists on matters of national interest. Among the subjects dealt with, of particular interest to the Institute were the supply of scientific books and Journals, salaries of scientific and medical teaching staffs in the Universities, scientific man-power and technological education. The Sub-Committee on "The Education of Technicians" held several meetings and took evidence from expert witnesses. A draft report was prepared.

British Standards Institution Committees

Instrument Industry Standards Committee.—The Committee received reports of the multifarious activities of the sub-committees dealing with standardization of instruments and allied subjects. In connexion with a national movement to increase productivity, the Committee considered ways in which its work could be expedited and the scope extended.

Technical Committee, Nomenclature and Symbols.—The Committee is engaged mainly on the preparation of glossaries and lists of symbols for telecommunications and radio frequency applications. In addition, through the British National Committee of the I.E.C. it has been co-operating in the revision of the international glossary. The Committee decided to recommend the publication of a memorandum on the M.K.S. system of electrical and magnetic units.

Technical Committees on the Suppression of Radio Interference.—The main work of these committees has been the revision of the key specification B.S. 800, making certain relaxations, including discontinuous interference, and allowing for a more convenient method of measurement. The British Standard for radio interference suppression in marine installations has been issued. Two measuring sets complying with B.S. 727 and suitable for use in connexion with British Standards on radio interference have been or are being made available for general use.

Technical Committee on Radiology.—This committee, having been largely reconstituted, met in October when the work of the previous four years was reviewed. It was reported that the sub-committee dealing with Terminology of Radiology had now defined some 267 terms out of a total of about 700, and estimated that another two years would be required for completion. The other sub-committees, having reported little or no progress were wound up. The Steering Sub-Committee set up in 1948 was enlarged and asked to advise on the re-organization of the main committee's work. It was also agreed, subject to the approval of the B.S.I., that the terms of reference of the main committee should be extended to cover Industrial Radiology, and that The Institute of Physics should be invited to nominate a representative on to the Steering Sub-Committee. This sub-committee would consider the standardization of source holders for industrial radiography. A sub-committee was also formed to standardize "Cable terminations and transformer and oil switch bushings."

Technical Committee on Radiographic Examination of Welded Joints.—This Committee is basing its work on the British Welding Research Association Committee's Recommendation on Radiographic Examination of Welded Joints in Pressure Vessels. General details have been agreed. The details of radiographic technique have been referred to a Sub-Committee on which five members of the Industrial Radiology Group are serving.

Technical Committee on X-ray Powder Diffraction Cameras.—A draft of a specification on two sizes of X-ray powder camera in common use was completed by June, and circulated to various manufacturers and laboratories for comment. The suggestions submitted have been considered and changes in the specification made to cover many useful criticisms received. A final version is nearing completion and it is hoped that the completed specification will be published in 1950.

Technical Committee on Acoustics Standards.—The main committee met for the first time during the year, and it was decided to work through a number of technical committees dealing with specialist sections of the field such as (*inter alia*) acoustical terminology, architectural acoustics, noise, magnetic sound recording, transducers, etc. The technical committees have met regularly, B.S. 880: 1949 Concert Pitch was issued during the course of the year.

THE INSTITUTE OF PHYSICS

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1949

1948						1948					
£		£	s.	d.	£ s. d.	£		£	s.	d.	£ s. d.
	To Office and General Expenses:—					5,583	By Members' Subscriptions				5,850 8 8
2,502	Salaries and National Insurance	2,999	8	5		409	„ Entrance and other Fees				435 1 6
153	Staff Superannuation	198	11	7		57	„ Dividends and Interest less Tax				40 5 5
1,330	Rent, Rates, Heating, Lighting, Cleaning, Maintenance, etc.	1,475	3	5		534	„ Contribution by the Endowment Trust Fund towards Administration Expenses				541 0 0
370	Board, Committees' and Officers' Travelling Expenses	401	6	3			„ Furniture and Equipment Fund:—				
752	Printing and Stationery	881	17	6		3	Donations by Members	2	2	0	
361	Postage and Telephone	430	19	5			Trust Fund for additional Furnishing Meeting Room	—	—	—	
341	Miscellaneous Expenses	278	11	6		34					2 2 0
	Printing List of Members	381	8	1			„ Balance, being Expenditure in Excess of Income				
13	Reserve for Australian Exchange	43	3	7		37	carried down				1,076 16 5
					7,090 9 9						
	„ Proportion of Cost of additional Furniture and Equipment written off				2 2 0						
37											
798	„ Copies of the Journal supplied to Members				853 2 3						
£6,657					£7,945 14 0	£6,657					£7,945 14 0

					£ s. d.					£ s. d.
	To Balance brought down				1,076 16 5		By Balance brought forward from last Year			160 7 4
	„ Amount written off Expenditure on Alterations, Improvements, and Adaptation of House				400 0 0		„ Contribution by Endowment Trust Fund towards amount written off Expenditure on Alterations, etc.			300 0 0
	„ Balance carried down				— — —		„ Balance carried down			1,016 9 1
					£1,476 16 5					£1,476 16 5
	To Balance brought down				£1,016 9 1					

PUBLICATIONS PROFIT AND LOSS ACCOUNT FOR THE YEAR ENDED 31st DECEMBER, 1949.

1948					1948				
£		£	s.	d.	£		£	s.	d.
860	To Stock on Hand, 1st January, 1949	1,197	9	7	6,577	By Sales and Subscriptions	6,818	0	4
4,665	„ Printing and Binding	5,043	5	8	1,769	„ Advertisements in Journal	2,664	7	0
6	„ Back Numbers Purchased	10	19	11	798	„ Institute of Physics for copies of the Journal distributed to Members	853	2	3
120	„ Honoraria for Special Articles	151	13	6		„ Grant from the Royal Society	950	0	0
252	„ Reprints and Laboratory Notes	345	7	0	103	„ Income Tax recovered	44	2	0
831	„ Dispatching and Publishing Expenses	779	16	9	1,197	„ Stock on Hand 31st December, 1949	1,207	5	0
3,688	„ Editorial and Administration Expenses	4,396	16	0					
17	„ Bad Debts written off	—	—	—					
	„ Publicity in connection with New Journal	252	13	11					
5	„ Balance carried to the Endowment Trust Fund Income and Expenditure Account	358	14	3					
£10,444		£12,536	16	7	£10,444		£12,536	16	7

BALANCE SHEET, 31st DECEMBER, 1949

1948		£ s. d.	£ s. d.
£	**LIFE MEMBERSHIP FUND:—**		
	As on 31st December, 1948	5,262 13 5	
	Add Amounts received in 1949 ..	31 10 0	
		5,294 3 5	
	Less Transfer to Reserve Fund in		
5,263	respect of deceased members ..	52 10 0	
			5,241 13 5
	RESERVE FUND:—		
	As on 31st December, 1948	1,604 17 5	
	Add Transfer from Life Membership		
	Fund	52 10 0	
		1,657 7 5	
	Less Loss on Sale of Investments ..	9 16 6	
1,605			1,647 10 11
	INCOME AND EXPENDITURE ACCOUNT:—		
160	(Balance)		— — —
	CURRENT LIABILITIES:—		
2,420	Subscriptions received in Advance	2,838 17 1	
532	X-Ray Diffraction Index	528 18 10	
437	Endowment Trust Fund	3,914 19 4	
4,760	For Expenses	4,721 15 2	
			12,004 10 5
	F. C. TOY,		
	President.		
	E. R. DAVIES,		
	Hon. Treasurer.		
£15,177			£18,893 14 9

1948		£ s. d.	£ s. d.
£	**FURNITURE, FITTINGS AND OFFICE EQUIPMENT:—**		
	At cost	3,070 0 0	
	Additions during the year ..	321 11 0	
		3,391 11 0	
	Less Amounts written off to date ..	1,452 16 11	
1,619			1,938 14 1
	ALTERATIONS, IMPROVEMENT AND ADAPTATION OF PREMISES:—		
	At cost	4,851 5 10	
	Additions during the year ..	3,247 7 4	
		8,098 13 2	
	Less Sales and amounts written off	1,343 12 9	
3,908			6,755 0 5
	INVESTMENTS:—		
	£500 3% Defence Bonds	500 0 0	
	£1,000 3% Savings Bonds	1,000 0 0	
	£500 2½% Defence Bonds	500 0 0	
	£660 13s. 7d. ½% Commonwealth of Australia Stock	736 15 3	
	£200 Commonwealth of Australia Saving Certificates	148 0 0	
	£1,820 3½% Commonwealth of Australia Victory Bonds	1,467 5 7	
	£600 3½% Commonwealth of Australia Bonds	480 0 0	
5,289			4,832 0 10
	(MARKET VALUE AT 31ST DECEMBER, 1949, £4,616)		
	CURRENT ASSETS:—		
	STOCKS ON HAND:—		
1,198	Publications .. 1,207 5 0		
600	Stationery 283 6 3		
		1,490 11 3	
1,117	SUNDRY DEBTORS	1,276 3 3	
78	SUBSCRIPTIONS DUE	68 15 0	
871	CASH AT BANK:—Current Account	1,368 19 8	
59	Deposit Account ..	4 13 11	
403	In Australia ..	83 15 11	
35	CASH IN HAND	58 11 4	
			4,351 10 4
	INCOME AND EXPENDITURE ACCOUNT:—		
	(Balance)		1,016 9 1
£15,177			£18,893 14 9

Report of the Auditors to the Members of the Institute of Physics

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purpose of our audit. In our opinion proper books of account have been kept by the Institute, so far as appears from our examination of those books and proper returns adequate for the purposes of our audit have been received from branches of the Institute not visited by us.

We have examined the above Balance Sheet and annexed Profit and Loss and Income and Expenditure accounts which are in agreement with the books of the Institute.

In our opinion and to the best of our information and according to the explanations given to us the said accounts give the information required by the Companies Act, 1948, in the manner so required and the Balance Sheet gives a true and fair view of the state of the Institute's affairs as at 31st December, 1949, and the Profit and Loss and Income and Expenditure Accounts give a true and fair view of the loss for the year ended on that date.

Spencer House, South Place, London, E.C.2.
28th February, 1950.

KNOX, CROPPER & CO., *Chartered Accountants.*

THE INSTITUTE OF PHYSICS ENDOWMENT TRUST FUND

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1949

1948		£ s. d.	1948		£ s. d.
£			£		
	To Laboratory Arts and National Certificates—Examinations	132 1 0	35	By Fees for Laboratory Arts and National Certificates	103 1 6
61			499	„ Donations	564 6 0
904	„ Expenses of Branches and Groups	688 10 0	273	„ Interest	109 10 0
209	„ Conference Expenses	462 0 5		„ Contribution to cost of Electron Jubilee Conference from sales of handbook	— — —
40	„ Educational Booklets and Reports	23 17 6	126		
5	„ Professional Charges	5 12 6		„ Balance transferred from Publications Profit and Loss Account	358 14 3
34	„ Additional cost of furnishing Meeting Room	— — —	5		
	„ Contribution to cost of Repairs and Alterations of House—amount written off	300 0 0	1,200	„ Balance carried to Endowment Fund	1,053 5 8
300					
	„ Proportion of overhead charges in connexion with the work carried on by the Trust	541 0 0			
534					
51	„ Loss on Sale of Investments	35 16 0			
	„ Contribution to cost of Repairs and Alterations of House—amount written off	— — —			
£2,138		£2,188 17 5	£2,138		£2,188 17 5

BALANCE SHEET, 31ST DECEMBER, 1949

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
ENDOWMENT FUND:—			INVESTMENTS:—		
As on 31st December, 1948	7,860 3 8		£400 3% Savings Bonds	400 0 0	
Less Transfer from Income and Expenditure Account	1,053 5 8		£1,500 2½% Defence Bonds	1,500 0 0	
		6,806 18 0	(MARKET VALUE ON 31ST DECEMBER, 1949, £1,782)		1,900 0 0
			PROPORTION OF ALTERATIONS, ETC., OF PREMISES PAYABLE BY THE TRUST FUND:—		
			As on 31st December, 1948	1,200 0 0	
			Less Amount written off this year	300 0 0	
					900 0 0
F. C. TOY, *President.*			DUE BY INSTITUTE OF PHYSICS		3,914 19 4
E. R. DAVIES, *Hon. Treasurer.*			INCOME TAX RECOVERABLE		91 18 8
		£6,806 18 0			£6,806 18 0

We have audited the above Balance Sheet and have obtained all the information and explanations we have required. We have verified the Bank balances and the investments. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Fund according to the best of our information and the explanations given to us and as shown by the books of the Fund.

Spencer House, South Place, London, E.C.2.
28*th February*, 1950

KNOX, CROPPER & CO., *Chartered Accountants.*

THE INSTITUTE OF PHYSICS BENEVOLENT FUND

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST DECEMBER, 1949

1948		£ s. d.	1948		£ s. d.
£			£		
421	To Grants	413 5 0	203	By Subscriptions and Donations	228 5 0
	„ Balance carried to Capital Fund	38 13 1	48	„ Interest	44 0 4
			22	„ Royalties on Handbook of Industrial Radiology	179 12 9
			148	„ Balance carried to Capital Account	— — —
£421		£451 18 1	£421		451 18 1

BALANCE SHEET, 31ST DECEMBER 1949

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
CAPITAL ACCOUNT:—			INVESTMENTS:—		
As on 31st December, 1948	1,224 15 11		£350 3½% War Stock	350 8 9	
Add Transfer from Income and Expenditure Account	38 13 1		£750 4% Consols	832 2 7	
		1,263 9 0	(MARKET VALUE ON 31ST DECEMBER, 1949, £4,616)		1,182 11 4
E. R. DAVIES, *Chairman of the Fund.*			CASH ON DEPOSIT AT POST OFFICE SAVINGS BANK		56 14 3
H. R. LANG, *Secretary of the Fund.*			INSTITUTE OF PHYSICS		17 8 5
			INCOME TAX RECOVERABLE		6 15 0
		£1,263 9 0			£1,263 9 0

We have audited the above Balance Sheet and have obtained all the information and explanations we have required. We have verified the Bank balances and the investments. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Fund according to the best of our information and the explanations given to us and as shown by the books of the Fund.

Spencer House, South Place, London, E.C.2
28th February, 1950.

KNOX, CROPPER & CO., *Chartered Accountants.*

THE REGISTER

ELECTIONS TO MEMBERSHIP

Fellows

An asterisk (*) indicates transfer from Associateship.

Bullard, Edward Crisp, M.A., Ph.D., Director of the National Physical Laboratory.

Butement, William Alan Stewart, B.Sc., Scientist, Defence Research Laboratories, Maribyrnong, Australia.

*Foster, Alan Wilfred, B.Sc., Ph.D., Physicist, Imperial Chemical Industries Ltd. (Dyestuffs Division), Billingham, Co. Durham.

*Law, Phillip Garth, M.Sc., Officer-in-Charge, Antarctic Division, Australian National Antarctic Research Expedition.

Reynolds, William Herbert, B.Sc., Headmaster, King's Norton Grammar School for Boys, Birmingham.

Associates

An asterisk (*) indicates transfer from Student.

Bagnall, Leslie, M.A., Lecturer in Physics, Royal Technical College, Glasgow.

Brown, Cedric John, B.Sc., Technical Officer, Imperial Chemical Industries Ltd. (Dyestuffs Division), Manchester.

*Brown, Geoffrey Martin, B.A., M.Sc., Assistant Lecturer in Physics, University College of Swansea.

Butler, Ronald, M.Sc., Assistant Lecturer, Mathematics Department, College of Technology, Manchester.

*Button, Charles Ezekiel, B.Sc., Research Physicist, "Shell" Refining and Marketing Co. Ltd., Chester.

Caspersz, Boniface Aloysius Modeste, B.Sc., Lecturer, Ceylon Technical College.

Collins, James, M.A., Assistant Physics Master, Paisley Grammar School.

*Duckworth, Henry Whalley, B.Sc., Research Student, University of Manchester.

Dutt, Panghugopal, M.Sc., Assistant Inspecting Officer (Scientific Supplies), High Commissioner for India.

*Dyer, Dennis Anthony, B.Sc., Scientific Officer, British Insulated Callender's Cables Ltd., London.

Francis, Gordon, B.Sc., Research Student, University of Oxford.

Gatenby, Ian Alexander, B.Sc., Research Student, University of Manchester.

Govindarajan, Sikalnayakanpet Rajagopala, M.A., M.Sc., Assistant Professor of Physics, Loyola College, Madras.

*Halliday, John Stephen, B.Sc., Research Student, University of Reading.

*Hearle, John William Stanley, B.A., Assistant Lecturer, College of Technology, Manchester.

Howson, Thomas Leslie, M.A., Senior Assistant in Physics, Enfield Technical College.

*Isard, John Oliver, B.A., B.Sc., Physicist, Research Laboratories of the General Electric Co. Ltd., Wembley.

Jarrett, Alan Hamer, M.Sc., Research Student, University of Manchester.

Johnson, Robert Brookes, B.Sc., Technical Assistant, Ferranti Ltd., Edinburgh.

*Jones, John Pritchard, B.Sc., Junior Research Physicist, British Cotton Industry Research Association, Manchester.

Knight, John James, B.Sc., A.R.C.S., Physicist, Royal National Throat, Nose and Ear Hospital, London.

Lister, William Clarke, B.Sc., Chief Sales Engineer, Muirhead and Co. Ltd., Beckenham, Kent.

MacCormac, Robert Cecil Hamilton, M.Sc., Senior Scientific Officer, Ministry of Supply, Woolwich.

Menter, James Woodham, M.A., Research Student, University of Cambridge.

*Michaels, Peter Albert, B.Sc., Scientific Staff, Research Laboratories of the General Electric Co. Ltd., Wembley.

Miles, Edward Ernest, B.Sc., Physicist, Research Laboratories of the General Electric Co. Ltd., Wembley.

Mowatt, David, M.A., B.Sc., Principal Teacher of Science, Shawlands Senior Secondary School, Glasgow.

*Orchard, B.Sc., Research Student, University of Reading.

Parry, Lindsay George, B.Sc., Lecturer in Physics, Sydney Technical College, Australia.

*Reavell, Frank Russell, B.A., Research Physicist, Lever Bros. and Unilever Ltd., Cheshire.

*Richardson, Donald Arthur, B.Sc., Research Physicist, Pilkington Brothers Ltd., St. Helens.

Rule, Eric, B.Sc., Physicist, Pametrade Research Station, Wallsend-on-Tyne.

Santesmases, Jose Garcia, Professor of Industrial Physics, University of Madrid.

Tunley, Harold, B.Sc., Senior Physics Master, Merchant Taylors' School, Crosby, Lancs.

*Wheatley, Bernard Miles, B.Sc., A.R.C.S., D.I.C., Hospital Physicist, Royal Cancer Hospital, London.

Yates, Brenda, B.Sc., Lecturer, Royal Technical College, Salford.

Graduates

Alexander, Vincent, B.Sc., Research Assistant, Harbens Ltd., Golborne, Lancs.

Bardsley, William, B.Sc., Research Student, Royal Holloway College, London.

Benson, William, B.Sc., Junior Research Officer, British Cotton Industry Research Association, Manchester.

Birtwistle, Brian, B.Sc., Post-Graduate Student, Imperial College of Science and Technology, London.

Blackie, John, B.Sc., Lecturer in Physics, Constantine Technical College, Middlesbrough.

Buchan, Ronald Charles Thomas, B.Sc., Lecturer in Physics, Plymouth Technical College.

Cayless, Maurice Arthur, B.Sc., A.R.C.S., Physicist, Research Laboratory, British Thomson-Houston Co. Ltd., Rugby.

Christie, David George, B.Sc., Technical Assistant, Imperial Chemical Industries Ltd., Welwyn Garden City.

Cleathero, Roy, B.Sc., Physicist, English Steel Co. Ltd., Sheffield.

Davies, David Elwyn, B.Sc., Demonstrator in Physics, University College of Swansea.

Davis, Philip, B.Sc., Lecturer in Physics, Northampton Polytechnic, London.

Delves, Frank Kenneth, B.Sc., Research Physicist, Lace Federation Research Council, Nottingham.

Dodgson, Reginald, B.Sc., Education Student, University of Durham.

Dudding, Raymond William, B.Sc., Experimental Staff, Research Laboratories of the General Electric Co. Ltd., Wembley.

Dutton, Jack, B.Sc., Research Student, University College of Swansea.

Eastbrook, John Norman, B.Sc., Research Student, University College of Cardiff.

Edyvean, William, B.Sc., Refining Physicist, "Shell" Refining and Marketing Co. Ltd., Cheshire.

Ellis, Kenneth, B.Sc., Lecturer in Physics, College of Technology, Leeds.

Evans, Wynn Humphreys, B.Sc., Research Student, University College of Wales, Aberystwyth.

Fry, Walvin Harry, B.Sc., Assistant Physicist, Sheffield National Centre for Radiotherapy.

Hall, Ivan Harold, B.Sc., Physicist, Tube Investments Ltd., Birmingham.

Hardy, Lawrence Donald, B.Sc., Technical Officer, Wool Industries Research Association, Leeds.

Harker, Thomas Henry, B.Sc., Royal Air Force.

Hester, Alec Geoffrey, B.Sc., A.R.C.S., Demonstrator in Physics, Imperial College of Science and Technology, London.

Horsfield, Alan Edward, B.A., Research Chemist, Universal Grinding Wheel Co. Ltd., Stafford.

Jones, Derry Wynn, B.Sc., Research Student, British Rayon Research Association, Manchester.

Kay, Edna, B.Sc., Scientific Officer, Royal Aircraft Establishment, Farnborough.

Keep, Kenneth Reginald, B.Sc., Research Student, University of Manchester.

Kell, Robert Christopher, B.Sc., Scientific Staff, Research Laboratories of the General Electric Co. Ltd., Wembley.

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